STI BULLETIN

A publication for users of the NASA Scientific and Technical Information Program Office

Spinoff 1996

Spinoff 1996

National Aeronautics and
Space Administration

NASA *Spinoff* Publication

NASA *Spinoff* features between forty and fifty companies each year that have successfully utilized NASA technology in commercial products or processes. NASA distributes tens of thousands of copies annually and maintains a database containing contact information for each manufacturer. Publication in *Spinoff* increases exposure of these companies, often leading to boosts in sales.

If you know of any products that incorporate NASA technology or assistance, please contact Walter Heiland at the NASA Center for AeroSpace Information at (301) 621-0241 or e-mail wheiland@sti.nasa.gov.

Spinoff 1996 can be viewed on the Internet (*http://www.sti.nasa.gov/tto/spinoff.html*).

To receive a **FREE** printed copy, call the National Technology Transfer Center at (304) 243-2455 or toll-free at (800) 678-6882.

CENTER NEWS
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Kennedy Space Center's New Leading-Edge Duplicating Facility

The Kennedy Space Center Print Shop, located in the Headquarters Building, has been converted from offset press/analog duplication to an all electronic Duplicating Facility. (The name has been changed to reflect its new capabilities.) Three electronic publishers and one multi-color printer have replaced 22 pieces of equipment. Three Xerox DocuTech 6135's include scanners to convert hardcopy documents to electronic format. "The new equipment can print at a higher rate and the product quality is much improved," noted Dave Severance, Information Services Project Manager for Sherikon Space Systems, Inc., the subcontractor which operates the facility for the Base Operations Contractor, EG&G Florida. This equipment offers increased flexibility to turn around large jobs in a very short time. Once a document is scanned into the system, or electronically transferred to the print file server, the electronic image can be networked to multiple publishers for simultaneous printing. Customers now have two options for submitting a printing request: electronic or hardcopy.

The new Duplicating Facility puts Kennedy Space Center on the leading edge of technology and sets the standard for duplicating centers within NASA.

NASA Video Catalog 1996

NASA SP-7109 (02)

VIDEO

National Aeronautics and
Space Administration
Langley Research Center
Scientific and Technical
Information Program Office

Video Catalog Update

The online version of the *NASA Video Catalog 1996* has been updated to include 68 videos recently added to the NASA STI Database. These video citations can be accessed separately or while looking through the full catalog. New and improved links to the paper and online order forms were also created. Take a look (*http://www.sti.nasa.gov/sti-pubs.html*).

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**Scientific and Technical
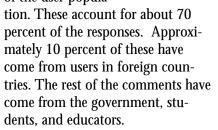Information Program Office**

NASA Image eXchange (NIX) First Month

by Lead Center Information Desk (Langley Research Center)

The NASA Image eXchange (NIX) had a very successful first month. The response since its release to the general public has been overwhelmingly positive. In the first month, the Scientific and Technical Information (STI) Program's Lead Center Information Desk received and responded to 69 comments. The majority of the comments have come from the general public and business segments of the user population. These account for about 70 percent of the responses. Approximately 10 percent of these have come from users in foreign countries. The rest of the comments have come from the government, students, and educators.

The questions have mainly focused on where to find particular types of images, with additional questions on usage and copyright. Other questions have focused on the growth of the database, such as when NIX will link to the Hubble Space Telescope image database, and when the rest of the NASA centers will be linked. There have also been several requests for information on how to obtain prints or download the images.

Many of the comments have simply been users complimenting the database and expressing pleasure at being able to access NASA photos from many centers from one location on the web. Following are some of the comments received:

May 15, 1997
"I believe it is an excellent idea that NASA has put together a searchable database of pictures. It will save me a lot of time, and I don't have to search all over the web for it."

May 15, 1997
"Absolutely outstanding from idea through implementation NIX hits one out of the park!!"

May 17, 1997
"Excellent. Always been a follower and a supporter of this program."

May 21, 1997
"Excellent idea to gather all the NASA pictures!!! But, there are tons missing. We assume that you are still in the build-up phase (?). Cheers and keep up the good work!"

May 22, 1997
"Wow! Very nice database system! I've always wanted to have a huge database of space images, as it's often tough to find neat images by surfing the web. Keep up the good work, NASA!"

May 27, 1997
"COOL PICTURES!!!!!!!!!!!!!!!!!!!!"

★   ★   ★

NIX is currently working to link four additional NASA centers and to make arrangements to add additional images, such as Hubble photos.

You can view and search NIX at url
http://nix.nasa.gov

The NASA STI Directory has been updated for 1997 and is now available online at the NASA STI Program home page:

http://www.sti.nasa.gov

The NASA Access Help Desk

e-mail:
help@sti.nasa.gov

fax:
301-621-0134

telephone:
301-621-0390

postal mail:
NASA Center for AeroSpace Information
800 Elkridge Landing Road
Linthicum Heights, MD 21090

Below is the profile description of the NASA STI Program from the upcoming, new *NASA Procedures and Guidelines*, NPG 2200.2A. In the future, publications in the NASA STI Report Series will be required to use this page as the inside front cover. A complete NPG link will be available in the near future from the NASA STI Program home page. Some pages, including this profile, will be available to download.

The NASA STI Program . . . in Profile

Since its founding, NASA has been dedicated to the advancement of aeronautics and space science. The NASA Scientific and Technical Information (STI) Program Office plays a key part in helping NASA maintain this important role.

The NASA STI Program Office is operated by Langley Research Center, the lead center for NASA's scientific and technical information. The NASA STI Program provides access to the NASA STI Database, the largest collection of aeronautical and space science STI in the world. The Program is also NASA's institutional mechanism for disseminating the results of its research and development activities. These results are published by NASA in the NASA STI Report Series, which includes the following report types:

- TECHNICAL PUBLICATION. Reports of completed research or a major significant phase of research that present the results of NASA programs and include extensive data or theoretical analysis. Includes compilations of significant scientific and technical data and information deemed to be of continuing reference value. NASA's counterpart of peer-reviewed formal professional papers but has less stringent limitations on manuscript length and extent of graphic presentations.

- TECHNICAL MEMORANDUM. Scientific and technical findings that are preliminary or of specialized interest, e.g., quick release reports, working papers, and bibliographies that contain minimal annotation. Does not contain extensive analysis.

- CONTRACTOR REPORT. Scientific and technical findings by NASA-sponsored contractors and grantees.

- CONFERENCE PUBLICATION. Collected papers from scientific and technical conferences, symposia, seminars, or other meetings sponsored or cosponsored by NASA.

- SPECIAL PUBLICATION. Scientific, technical, or historical information from NASA programs, projects, and missions, often concerned with subjects having substantial public interest.

- TECHNICAL TRANSLATION. English-language translations of foreign scientific and technical material pertinent to NASA's mission.

Specialized services that complement the STI Program's diverse offerings include creating custom thesauri, building customized databases, organizing and publishing research results . . . even providing videos.

For more information about the NASA STI Program, see the following:

- Access the NASA STI Program Home Page at *http://www.sti.nasa.gov*

- E-mail your question via the Internet to help@sti.nasa.gov

- Fax your question to the NASA Access Help Desk at (301) 621-0134

- Telephone the NASA Access Help Desk at (301) 621-0390

- Write to:
  NASA Access Help Desk
  NASA Center for AeroSpace Information
  800 Elkridge Landing Road
  Linthicum Heights, MD 21090-2934

Searching Report Numbers

Several techniques can aid in searching Report Numbers in RECONplus. Report Numbers

RECONplus Search Tips

are usually serial-style numbers, such as NASA-TM-106575, which put similar documents in a numbered group for easy reference. In the Quick search mode, tab to the Document ID Numbers line and press control-L. A dialogue box will appear prompting for a 'stem.' The stem is the first letters or numbers of the value you are expecting to find. In the example above, we might type:

NASATM106575

and then press enter. Remember: Number-type indexes have no punctuation. A list displays all of the values in the Numbers (NU) index, which includes Report Numbers. We find the number does not appear as we typed it, but that volume numbers have been added, thus:

NASATM106575VOL1

NASATM106575VOL2

This means it is a multivolume set, and the volume has been added as part of the report number designation for each item. This normally

prevents us from finding the citation, but by using this technique, we are sure of the result.

Choosing items from the list is accomplished by tabbing or using the up and down arrow keys to highlight the value desired, then pressing control-G for each item desired. A selection box at the bottom or right of the screen displays your selections. The control-G is a toggle command, allowing for selection and deselection of the highlighted item. Pressing enter accepts the selections made.

The same technique can be applied in the Command mode by typing the index mnemonic tag (e.g. RN) and pressing control-L. From that point, the process is the same, using the highlight and the control-G to

select or deselect the value desired. This technique is useful any time the value searched is highly variable, such as author or when variations in form could result in uncertain search results, such as in the case of report numbers.

If you have other questions on the use of RECONplus, contact the NASA Access Help Desk at (301) 621-0390 or by electronic mail at help.sti.nasa.gov

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Watch for more RECONplus Search Tips in future issues of the *STI Bulletin.*

You are privileged to take a sneak preview of *Spinoff 1997* below, to be released in late summer/early Fall of this year. See page 1 for more details on the *Spinoff* publication.

Miniature Heat Pipes

The widespread and fast-paced adoption of notebook computers in the home, workplace and on-the-road owes part of its success to space shuttle and space station technology.

Thermacore Inc. of Lancaster, Pennsylvania has been associated with Goddard Space Flight Center since 1989. NASA Small Business Innovation Research (SBIR) contracts with Thermacore fostered company work on devices tagged "heat pipes" for space applications.

A heat pipe moves heat from spot-to-spot with little loss in temperature. The heat pipe employs a two-phase process in which a liquid is evaporated inside the pipe by heat input at one end. The resulting vapor is condensed back into the liquid by heat removal at the pipe's other end. The condensate is then returned to the evaporator by capillary action in a wick.

To control the extreme temperature ranges in space, heat pipes are vitally important to spacecraft. Of additional benefit is that heat pipes do not suffer from the wear and tear of moving parts. They are, therefore, exceptionally reliable.

As Thermacore's Chairman, G. Yale Eastman, points out: "All heat pipes are not created equal." Using its own funds, the firm employed knowledge gained from SBIR research to solve a challenge in the commercial marketplace of notebook computers.

The problem was to maintain an 8-watt central processing unit (CPU)—the real brains of a computer—at less than 90 degrees Celsius in a notebook computer using no power, with very little space available and without using forced convection. Using a fan to cool this electronic circuitry required far too much battery power. That would reduce the useful operating time of the notebook.

Thermacore's answer was in the design of a powder metal wick that transfers CPU heat from a tightly confined spot to an area near available air flow. The Thermacore heat pipe technology permits a notebook computer to be operated in any position, even upside down, without loss of performance.

Miniature heat pipe technology has successfully been applied, such as in Pentium® Processor notebook computers. In desktop computers, higher-powered CPU chips or multi-chip modules means higher-powered power supplies, more memory and other power-hungry components. Each of these components dissipates heat. Thermacore expects its heat pipes to accommodate these computers as well.

Given the high volume of computer manufacturing, the cost of heat pipes has been reduced significantly, quite often providing an economical solution to many cooling applications. Thermacore has used company funds to develop the fabrication processes needed and to build the factory required for mass production of miniature heat pipe technology. Production rates have already exceeded 5,000 units per day.

Cellular telephones, camcorders, and other hand-held electronics are foreseeable applications for heat pipes, predicts the company.

By advancing commercial use of federally-sponsored research, Thermacore received in October 1996 the SBIR Technology of the Year Award in the Computer/Electronics category.

® Pentium is a registered trademark of Intel Corporation.

NASA heat pipe technology used in spacecraft to keep hardware and critical electronics cool has found its way into notebook computers. Tiny heat pipes are in wide use to cool the main central processor chip.

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